FIGURE 1

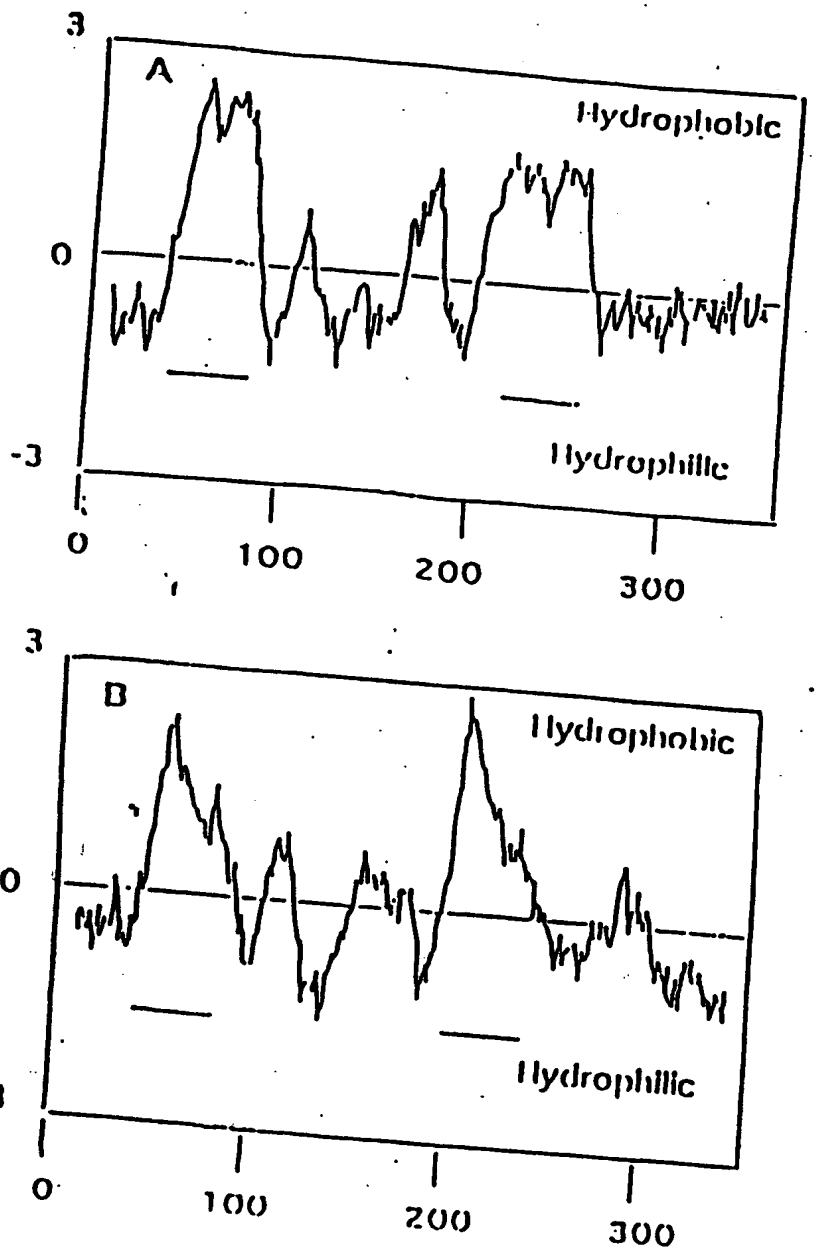

3
A
Hydrophobic
0
-3
Hydrophilic
0
100
200
300
3
B
Hydrophobic
0
-3
Hydrophilic
0
100
200
300

FIGURE 2

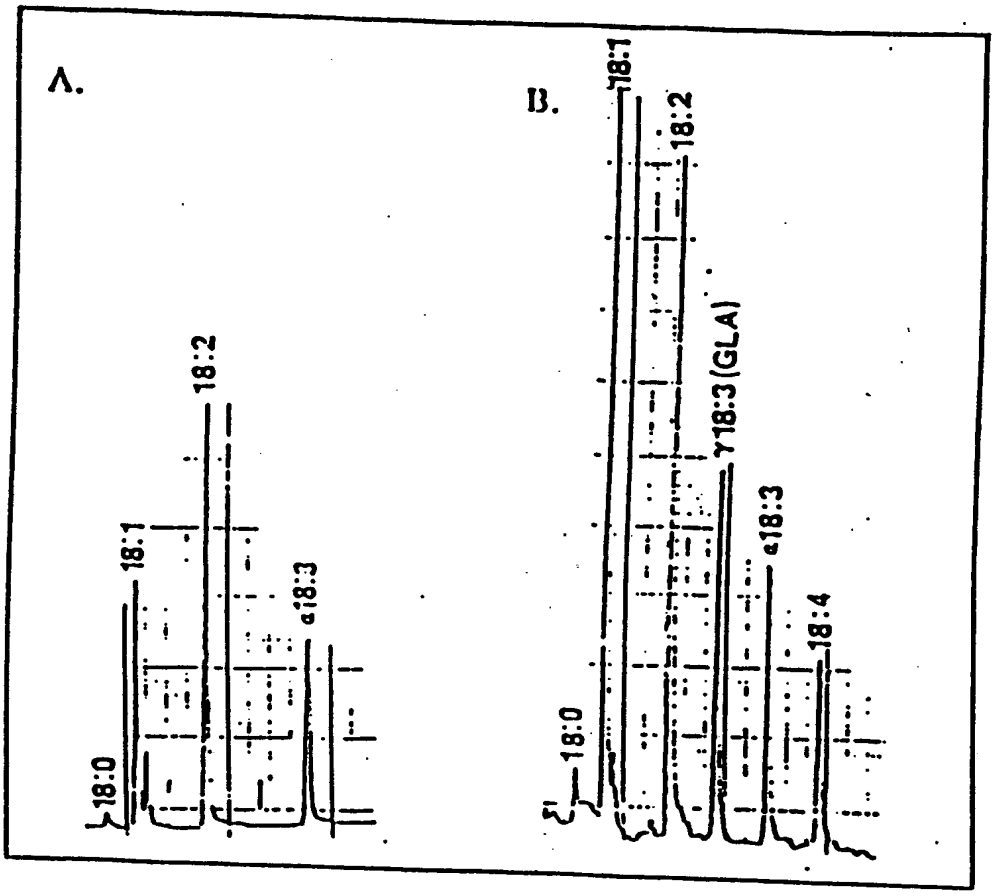

A.
B.
18:0
18:1
18:2
α18:3
γ18:3(GLA)
18:4
Detector Response
Retention Time

FIGURE 3

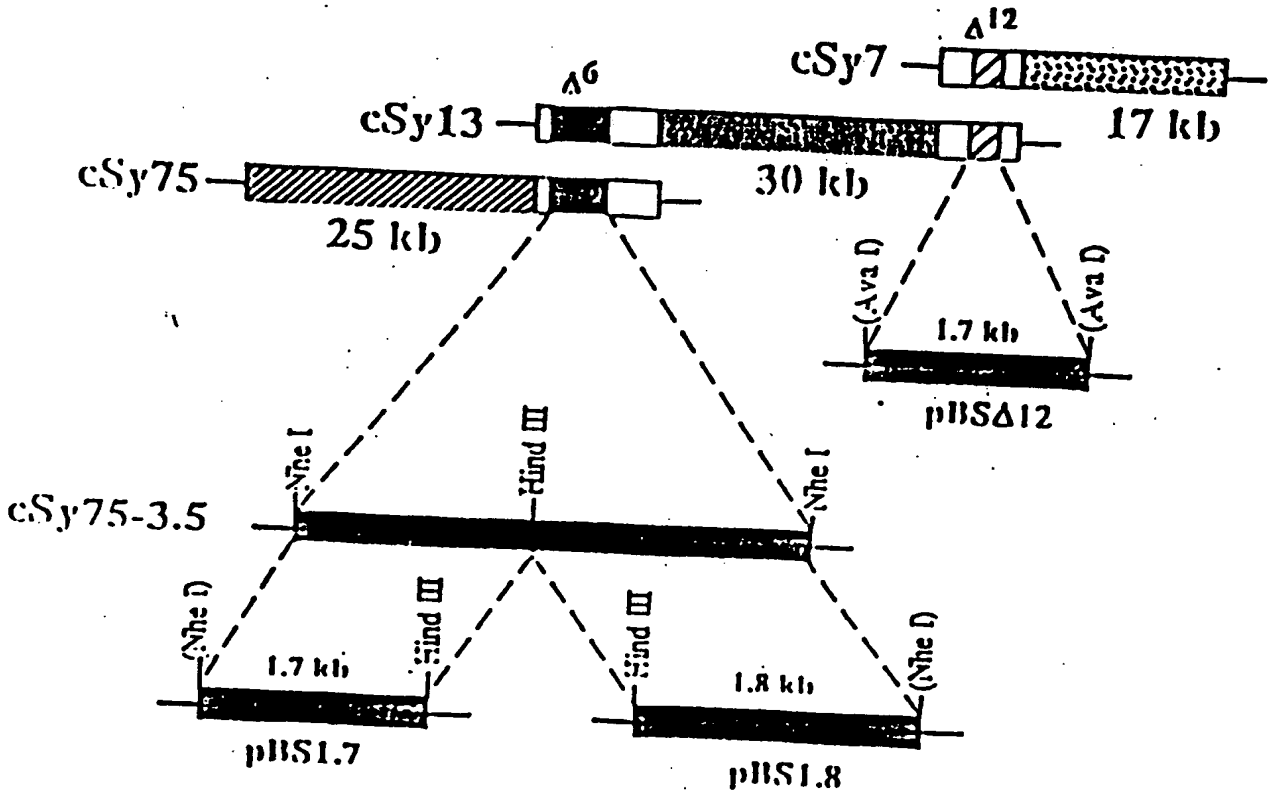
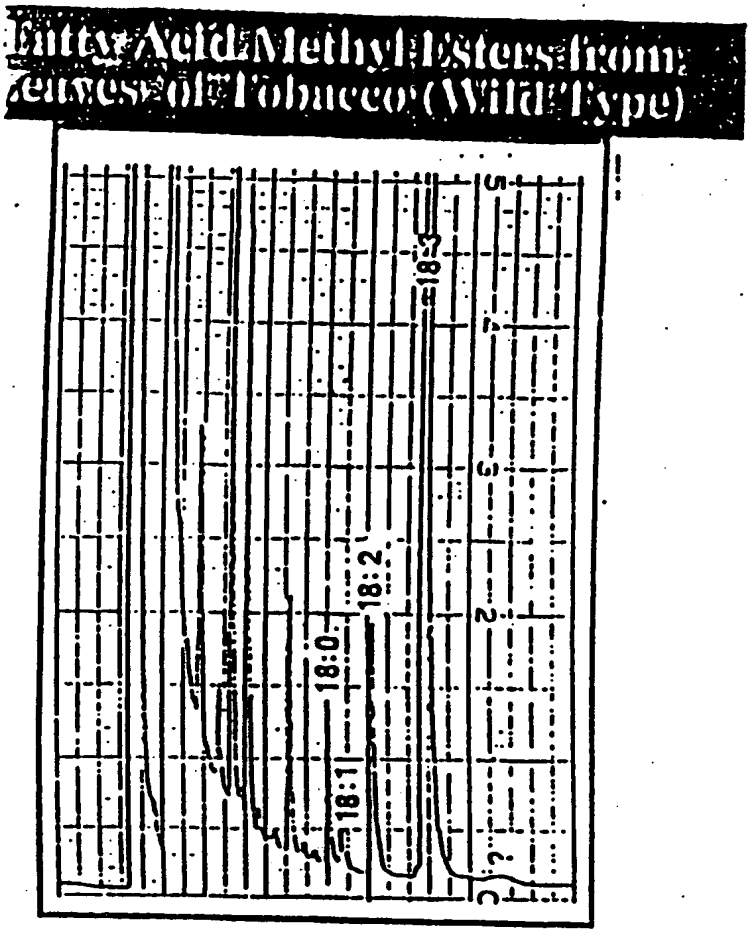
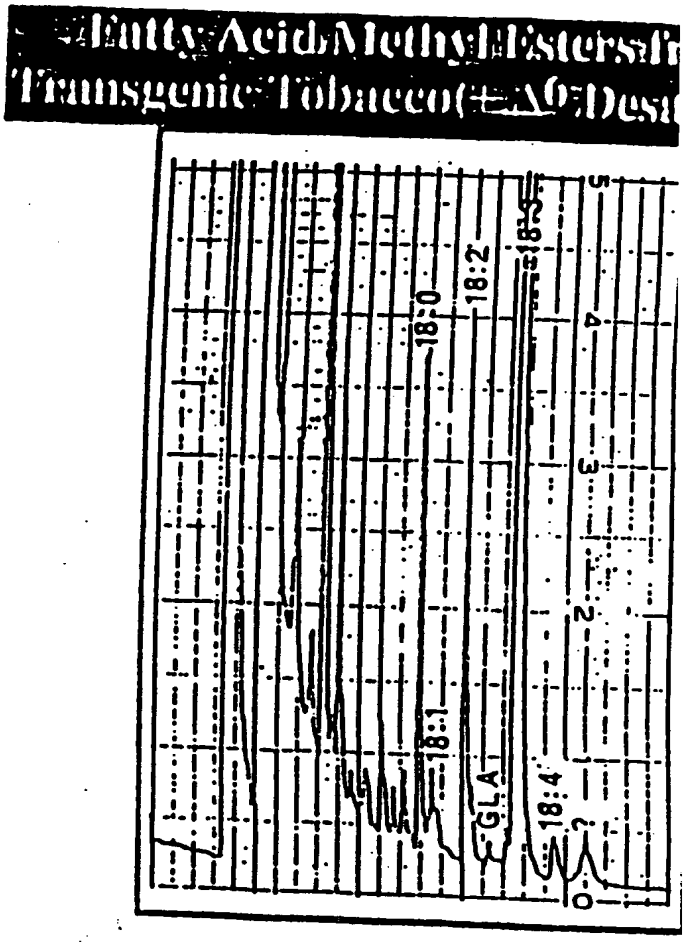

Δ12
cSy7
17 kb
Δ6
cSy13
30 kb
cSy75
25 kb
(Ava I)
1.7 kb
(Ava I)
pBSΔ12
Nhe I
Hind III
Nhe I
cSy75-3.5
(Nhe I)
Hind III
Hind III
(Nhe I)
1.7 kb
1.8 kb
pBS1.7
pBS1.8

FIGURE 4

A



B



A

```
   1 aatatctgcc taccctccca aagagagtag tcatttttca tcaatggctg ctcaaatcaa gaaatacatt acctcagatg   80
  81 aactcaagaa ccacgataaa cccggagatc tatggatctc gattcaaggg aaagcctatg atgtttcgga ttgggtgaaa  160
 161 gaccatccag gtggcagctt tcccttgaag agtcttgctg gtcaagaggt aactgatgca tttgttgcat tccatcctgc  240
 241 ctctacatgg aagaatcttg ataagttttt cactgggtat tatcttaaag attactctgt ttctgaggtt tctaaagatt  320
 321 ataggaagct tgtgtttgag ttttctaaaa tgggtttgta tgacaaaaaa ggtcatatta tgtttgcaac tttgtgcttt  400
 401 atagcaatgc tgtttgctat gagtgtttat ggggttttgt tttgtgaggg tgttttggta catttgtttt ctgggtgttt  480
 481 gatggggttt ctttggattc agagtggttg gattggacat gatgctgggc attatatggt agtgtctgat tcaaggctta  560
 561 ataagtttat gggtattttt gctgcaaatt gtctttcagg aataagtatt ggttggtgga aatggaacca taatgcacat  640
 641 cacattgcct gtaatagcct tgaatatgac cctgatttac aatatatacc attccttgtt gtgtcttcca agtttttttgg  720
 721 ttcactcacc tctcatttct atgagaaaag gttgactttt gactctttat caagattctt tgtaagttat caacattgga  800
 801 cattttaccc tattatgtgt gctgctaggc tcaatatgta tgtacaatct ctcataatgt tgttgaccaa gagaaatgtg  880
 881 tcctatcgag ctcaggaact cttgggatgc ctagtgttct cgatttggta cccgttgctt gtttcttgtt tgcctaattg  960
 961 gggtgaaaga attatgtttg ttattgcaag tttatcagtg actggaatgc aacaagttca gttctccttg aaccacttct 1040
1041 cttcaagtgt ttatgttgga aagcctaaag ggaataattg gtttgagaaa caaacggatg ggacacttga catttcttgt 1120
1121 cctccttgga tggattggtt tcatggtgga ttgcaattcc aaattgagca tcatttgttt cccaagatgc ctagatgcaa 1200
1201 ccttaggaaa atctcgccct acgtgatcga gttatgcaag aaacataatt tgccttacaa ttatgcatct ttctccaagg 1280
1281 ccaatgaaat gacactcaga acattgagga acacagcatt gcaggctagg gatataacca agccgctccc gaagaatttg 1360
1361 gtatgggaag ctcttcacac tcatggttaa aattaccctt agttcatgta ataatttgag attatgtatc tcctatgttt 1440
1441 gtgtcttgtc ttggttctac ttgttggagt cattgcaact tgtcttttat ggtttattag atgtttttta atatatttta 1520
1521 gaggtttttgc tttcatctcc attattgatg aataaagagt tacatattgt caattgttgt gctcaatatc tgatattttg 1600
1601 gaatgtactt tgtaccactg tgttttcagt tgaagctcat gtgtactttct atagactttg tttaaatggt tatgtcatgt 1680
1681 tattt
                                                                                          1685
```

B

```
  1 MAAQIKKYIT SDELKNHDKP GDLWISIQGK AYDVSDWVKD HPGGSFPLKS LAGQEVTDAF VAFHPASTWK NLDKFFTGYY  80

 81 LKDYSVSEVS KDYRKLVFEF SKMGLYDKKG HIMFATLCFI AMLFAMSVYG VLFCEGVLVH LFSGCLMGFL WIQSGWIGHD 160

161 AGHYMVVSDS RLNKFMGIFA ANCLSGISIG WWKWNHNAHH IACNSLEYDP DLQYIPFLVV SSKFFGSLTS HFYEKRLTFD 240

241 SLSRFFVSYQ HWTFYPIMCA ARLNMYVQSL IMLLTKRNVS YRAQELLGCL VFSIWYPLLV SCLPNWGERI MFVIASLSVT 320

321 GMQQVQFSLN HFSSSVYVGK PKGNNWFEKQ TDGTLDISCP PWMDWFHGGL QFQIEHHLFP KMPRCNLRKI SPYVIELCKK 400

401 HNLPYNYASF SKANEMTLRT LRNTALQARD ITKPLPKNLV WEALHTHG
                                                                                        448
```

FIGURE 5

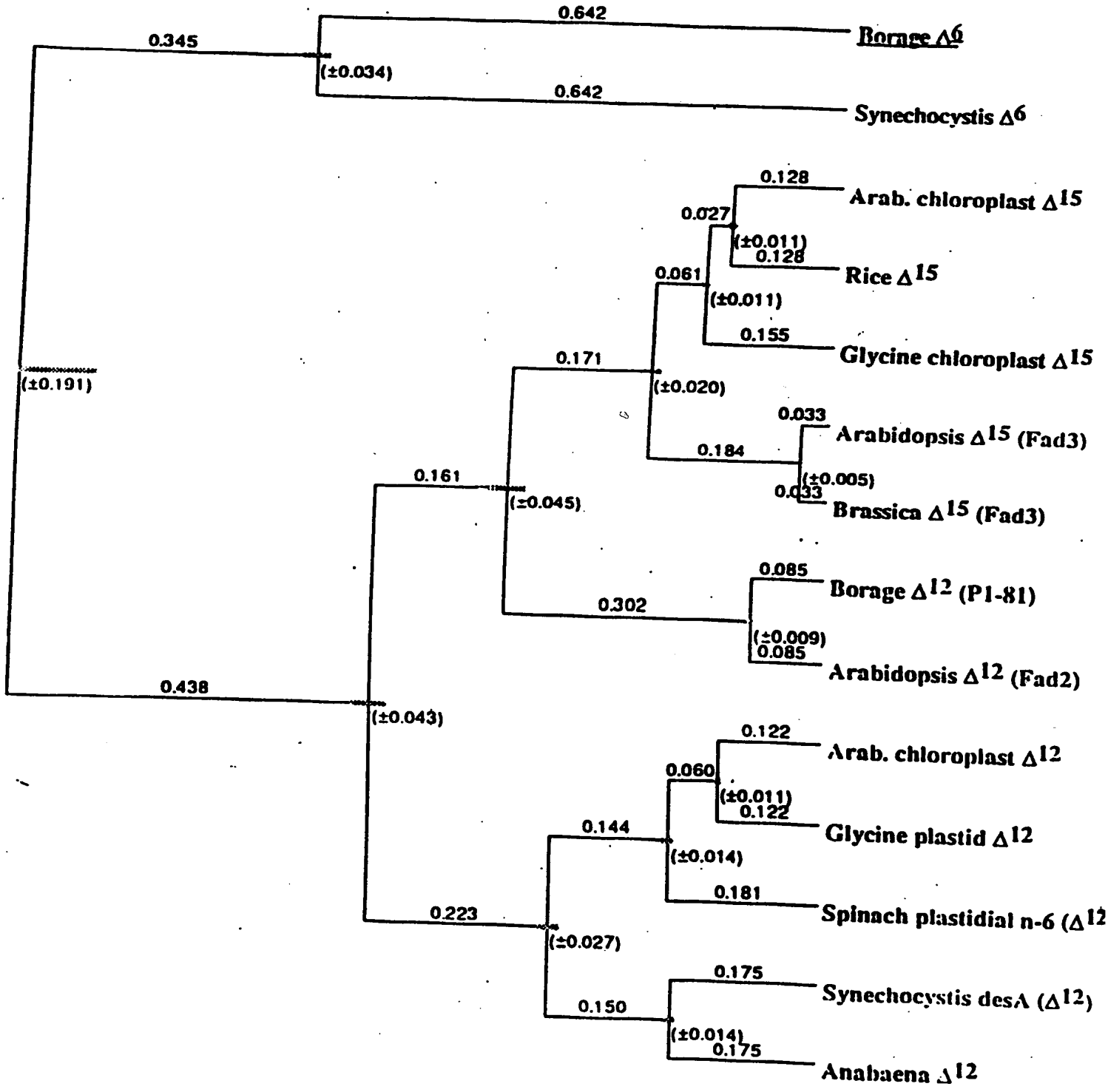

0.642
Borage Δ6
0.345
(±0.034)
0.642
Synechocystis Δ6
0.128
Arab. chloroplast Δ15
0.027
(±0.011)
0.128
Rice Δ15
0.061
(±0.011)
0.155
Glycine chloroplast Δ15
0.171
(±0.020)
0.033
Arabidopsis Δ15 (Fad3)
0.184
(±0.005)
0.033
Brassica Δ15 (Fad3)
(±0.191)
0.161
(±0.045)
0.085
Borage Δ12 (P1-81)
0.302
(±0.009)
0.085
Arabidopsis Δ12 (Fad2)
0.438
(±0.043)
0.122
Arab. chloroplast Δ12
0.060
(±0.011)
0.122
Glycine plastid Δ12
0.144
(±0.014)
0.181
Spinach plastidial n-6 (Δ12
0.223
(±0.027)
0.175
Synechocystis desA (Δ12)
0.150
(±0.014)
0.175
Anabaena Δ12

FIGURE 6

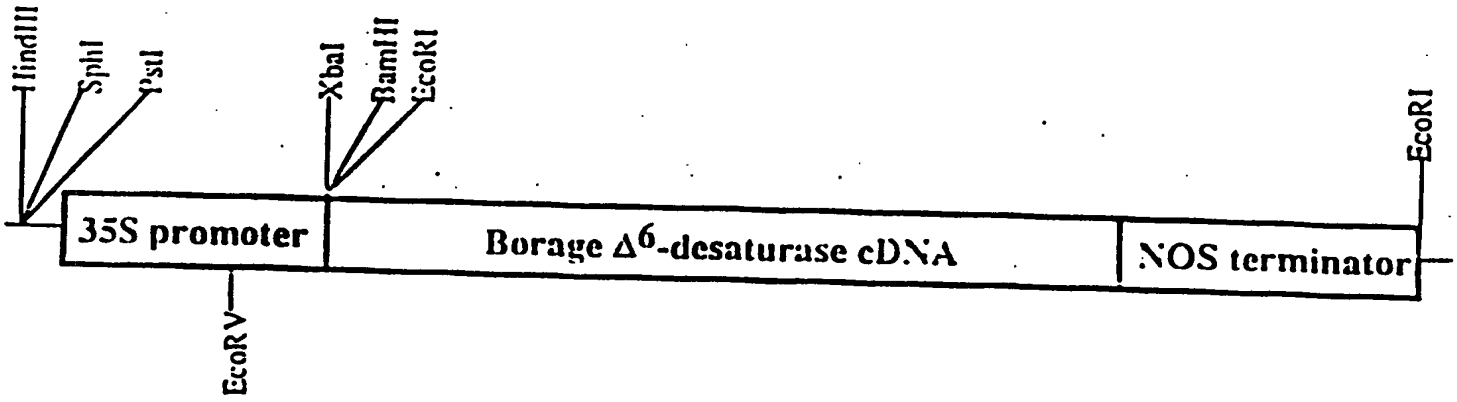

HindIII
SphI
PstI
XbaI
BamHI
EcoRI
EcoRI
35S promoter
Borage Δ6-desaturase cDNA
NOS terminator
EcoRV

FIGURE 7

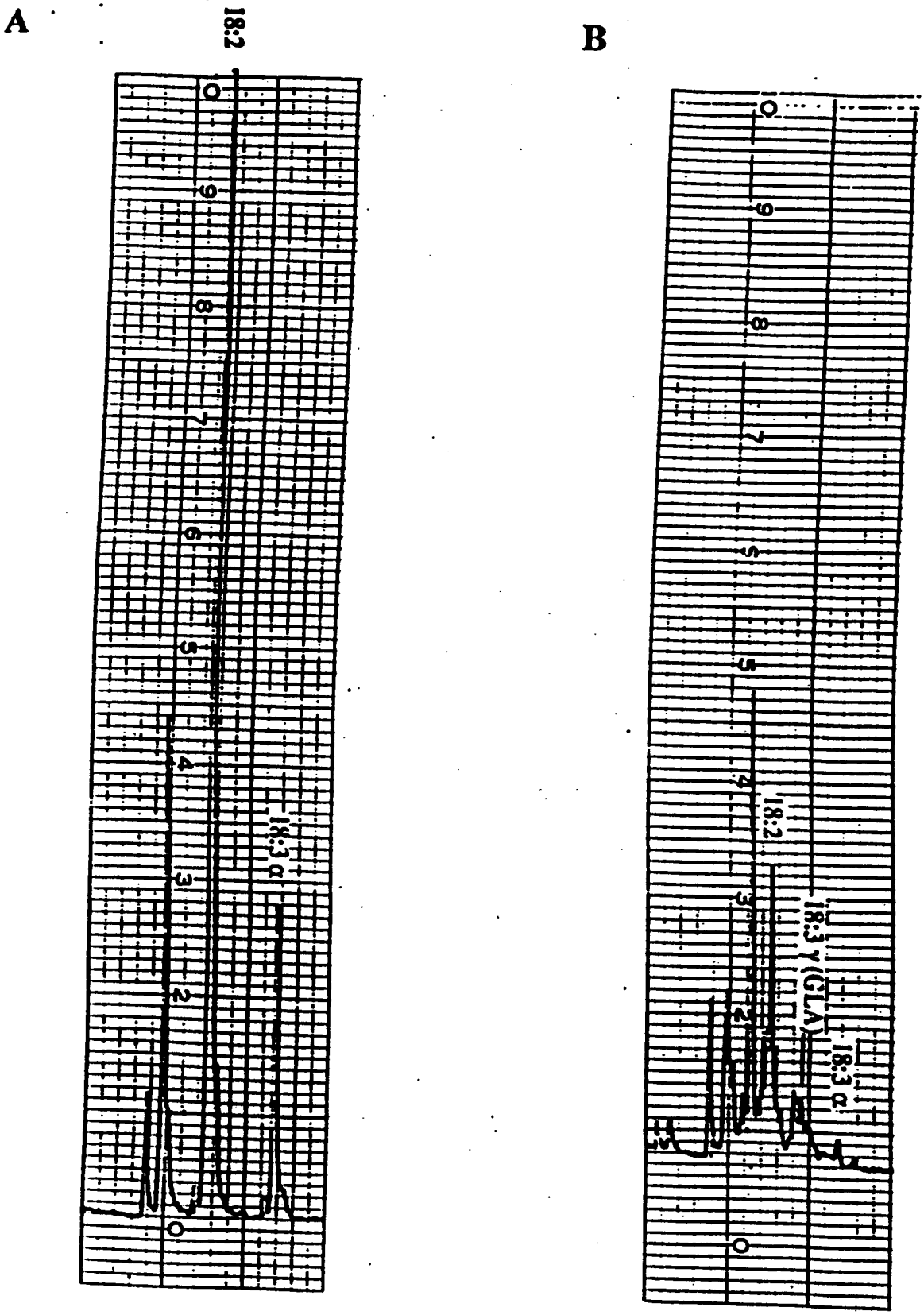
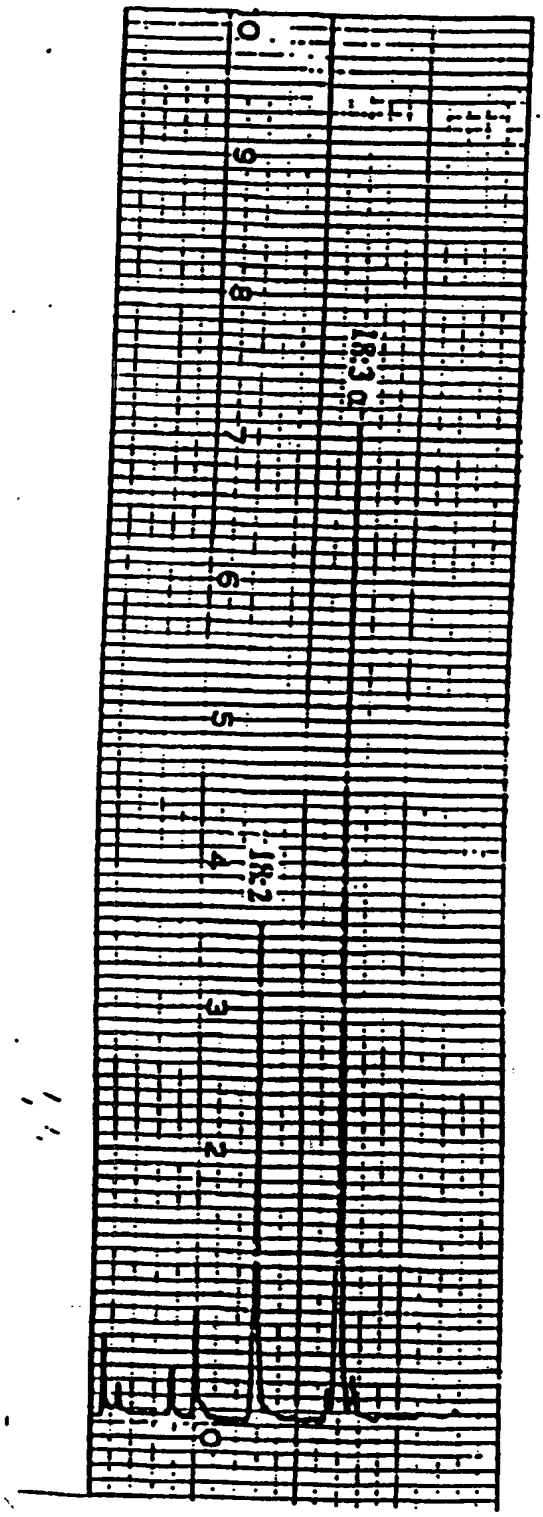


FIGURE 8

A



B

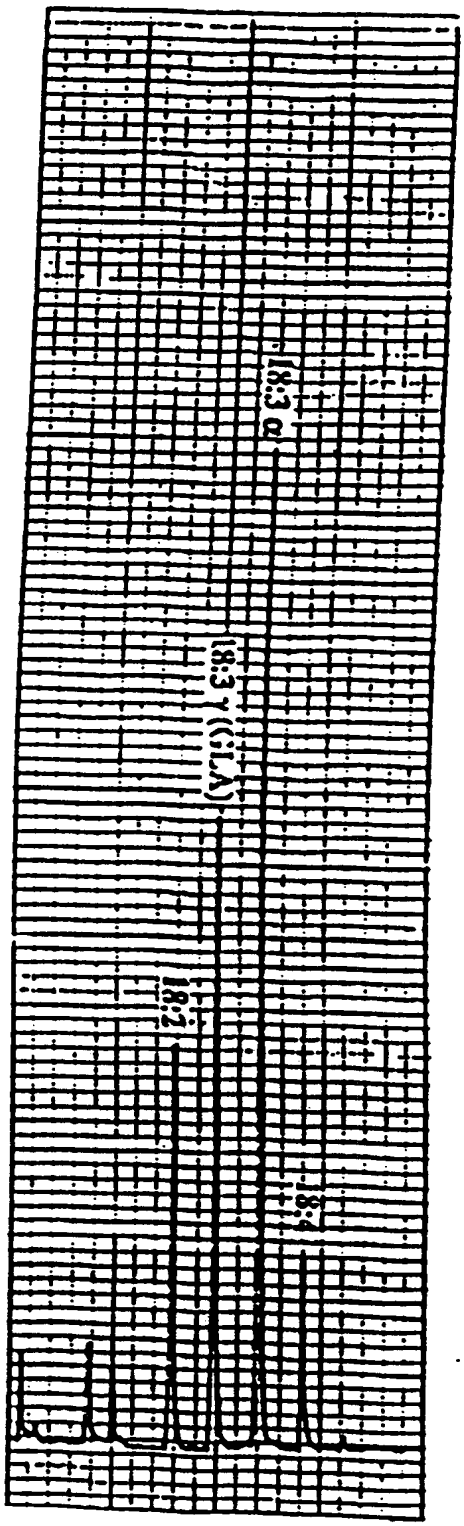


Fig. 9

Complete DNA sequence and deduced amino acid sequence of Evening Primrose putative Δ^6-desaturase

```
                  CCCCAAAAAATTTTCATTGTTCTCCATCTGGACCACAGCATCCACACAATG GAG GGC GAA
                                                                      M   E   G   E
GCT AAG AAG TAT ATC ACG GCG GAG GAC CTC CGC CGC CAC AAC AAG TCC GGC GAT CTC TGG
A   K   K   Y   I   T   A   E   D   L   R   R   H   N   K   S   G   D   L   W
ATC TCC ATC CAG GGC AAG GTC TAC GAC GTC TCT CGG TGG GCG GCG GAG CAC CCC GGC GGC
I   S   I   Q   G   K   V   Y   D   V   S   R   W   A   A   E   H   P   G   G
GAG GTC CCG CTC CTC ATG CTG GCC GGC CAG GAC GTC ACC GAC GCC TTC ATT GCG TAC CAC
E   V   P   L   L   M   L   A   G   Q   D   V   T   D   A   F   I   A   Y   H
CCG GGC ACG GCG TGG CGG CAT CTG GAT CCG CTC TTC ACC GGC TAC TAC CTC AAG GAC TTC
P   G   T   A   W   R   H   L   D   P   L   F   T   G   Y   Y   L   K   D   F
GAA GTG TCG GAG ATC TCC AAG GAC TAC CGG AGG CTT TTG AAC GAG ATG TCG CGG TCC GGG
E   V   S   E   I   S   K   D   Y   R   R   L   L   N   E   M   S   R   S   G
ATC TTC GAG AAG AAG GGC CAC CAC ATC ATG TGG ACG TTC GTC GGC GTT GCG GTC ATG ATG
I   F   E   K   K   G   H   H   I   M   W   T   F   V   G   V   A   V   M   M
GCG GCA AtC GTC TAC GGC GTG CTG GCG TCG GAG TCC GTC GGA GTT CAC ATG CTC TGC GGC
A   A   I   V   Y   G   V   L   A   S   E   S   V   G   V   H   M   L   C   G
GCA CTG CTG GGC TTG CTG TGG ATC CAA GCC GCG TAT GTG GGC CAT GAC TCC GGC CAT TAC
A   L   L   G   L   L   W   I   Q   A   A   Y   V   G   H   D   S   G   H   Y
CAG GTG ATG CCA ACC CGT GGA TAC AAC AGA ATC ACG CAA CTC ATA GCA GGC AAC ATC CTA
Q   V   M   P   T   R   G   Y   N   R   I   T   Q   L   I   A   G   N   I   L
ACC GGA ATC AGC ATC GCG TGG TGG AAG TGG ACC CAC AAC GCC CAC CAC CTC GCC TGC AAC
T   G   I   S   I   A   W   W   K   W   T   H   N   A   H   H   L   A   C   N
AGC CTC GAC TAC GAC CCC GAC CTC CAG CAC ATC CCC GTA TTC GCC GTC TCC ACC CGA CTC
S   L   D   Y   D   P   D   L   Q   H   I   P   V   F   A   V   S   T   R   L
TTC AAC TCC ATC ACC TCG GTC TTC TAT GGC CGA GTC CTG AAA TTC GAC GAA GTG GCA CGG
F   N   S   I   T   S   V   F   Y   G   R   V   L   K   F   D   E   V   A   R
TTC CTA GTC AGC TAC CAG CAC TGG ACC TAC TAC CCG GTC ATG ATC TTC GGC CGA GTC AAC
F   L   V   S   Y   Q   H   W   T   Y   Y   P   V   M   I   F   G   R   V   N
CTC TTC ATC CAG ACC TTT TTA TTG CTC CTC ACC AGG CGC GAC GTC CCT GAC CGC GCT CTA
L   F   I   Q   T   F   L   L   L   L   T   R   R   D   V   P   D   R   A   L
AAC TTA ATG GGT ATC GCG GTT TTC TGG ACG TGG TTC CCG CTC TTC GTA TCT TGT CTC CCG
N   L   M   G   I   A   V   F   W   T   W   F   P   L   F   V   S   C   L   P
AAC TGG CCT GAA CGG TTC GGG TTC GTC CTC ATC AGC TTT GCG GTC ACG GCG ATC CAG CAC
N   W   P   E   R   F   G   F   V   L   I   S   F   A   V   T   A   I   Q   H
GTC CAG TTC ACG CTC AAC CAC TTC TCC GGC GAC ACA TAC GTG GGC CCC CCC AAG GGC GAC
V   Q   F   T   L   N   H   F   S   G   D   T   Y   V   G   P   P   K   G   D
AAC TGG TTC GAG AAG CAG ACG AAA GGG ACG ATC GAT ATC ACG TGC CCA CCG TGG ATG GAC
N   W   F   E   K   Q   T   K   G   T   I   D   I   T   C   P   P   W   M   D
TGG TTC TTT GGT GGG CTG CAG TTC CAG TTG GAG CAC CAC TTG TTC CCT AGG CTG CCG CGT
W   F   F   G   G   L   Q   F   Q   L   E   H   H   L   F   P   R   L   P   R
GGG CAG CTT AGG AAG ATT GCG CCC TTG GCT CGG GAC TTG TGT AAG AAG CAC GGG ATG CCG
G   Q   L   R   K   I   A   P   L   A   R   D   L   C   K   K   H   G   M   P
TAT AGG AGC TTC GGG TTT TGG GAC GCT AAT GTC AGG ACA ATT CGG ACG CTG AGG GAT GCG
Y   R   S   F   G   F   W   D   A   N   V   R   T   I   R   T   L   R   D   A
GCG GTT CAG GCG CGT GAC CTT AAT TCG GCC CCG TGC CCT AAG AAA CTT GGG TAT GGG GAA
A   V   Q   A   R   D   L   N   S   A   P   C   P   K   K   L   G   Y   G   E
GCT TAT AAC ACC CAT GGT TGA TTG TGG TTT TGT GTT GTG GGT TGG AGG ATC TTC TTA TTA
A   Y   N   T   H   G   *
TTGATTTATGTCCACAATATTGAACTGAATAACCATGGAAGGCACTACGTTCAGCTTAACTTTGCTAGCTGGTTGCGTT
CCCTTGTTGGGGGCAAAGTGCAGTATTTATTTTCTTATCCCATGTACTTTTTGATTATTGTTCTTATTCGTATCATAAA
TAATTTATTATTGATTAATTTTTGTTGTAGTTGGGTGTCTATAGCAAGTTTATAATACTGAGATATATTTTTTTGGTAA
AAAAAAAAAA
```

FIGURE 10

EP vs Bo Delta 6-desaturase Formatted Alignment

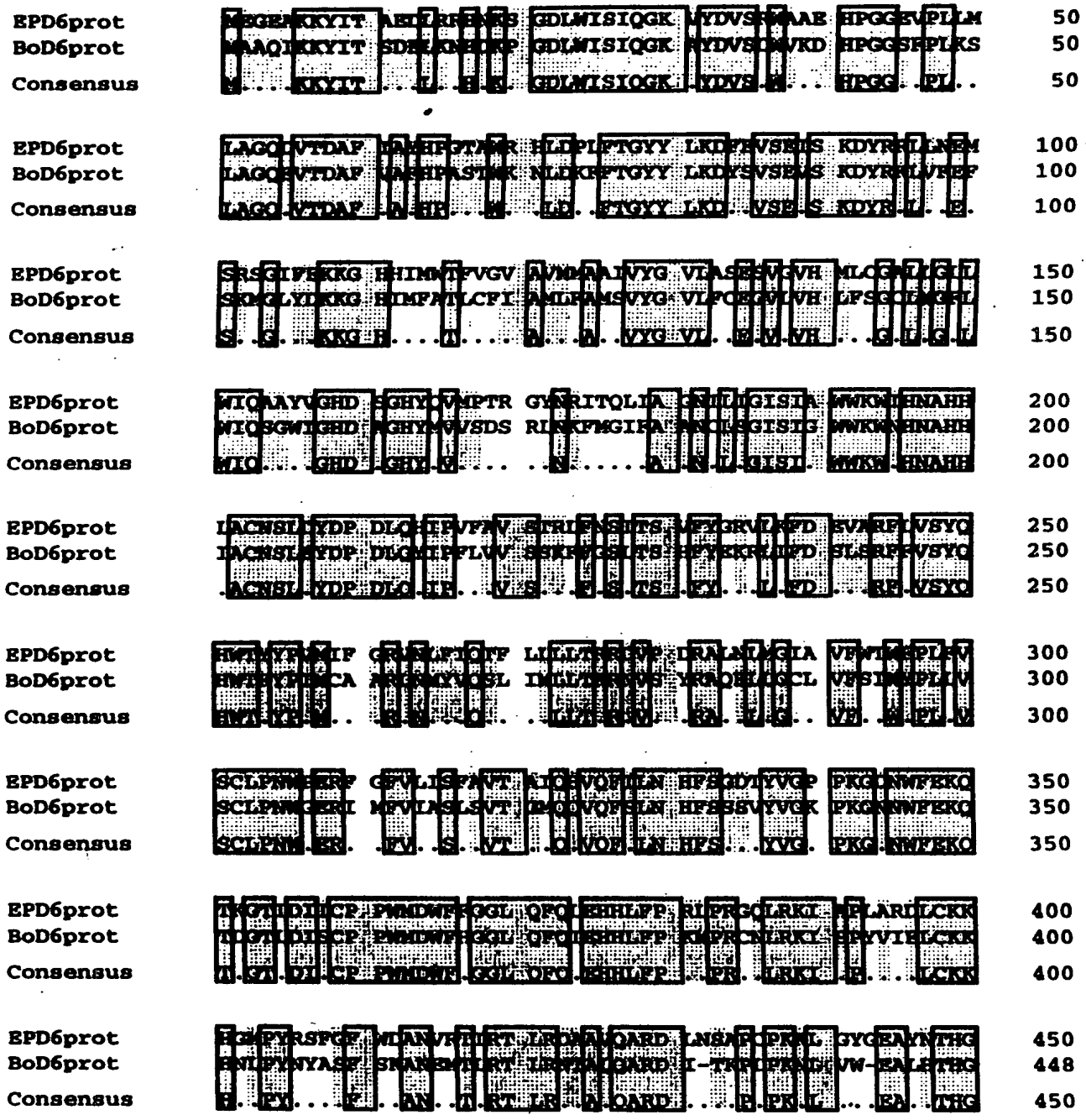
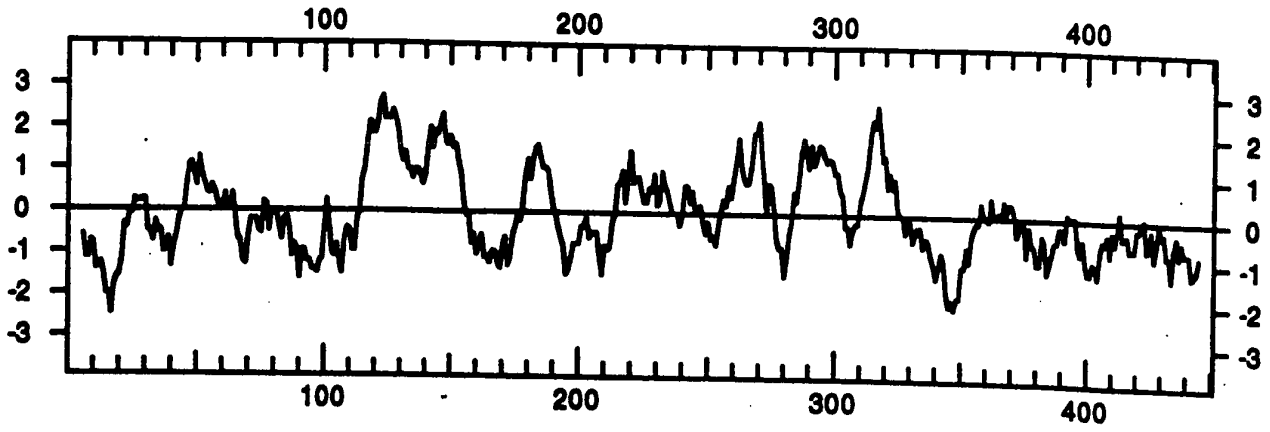


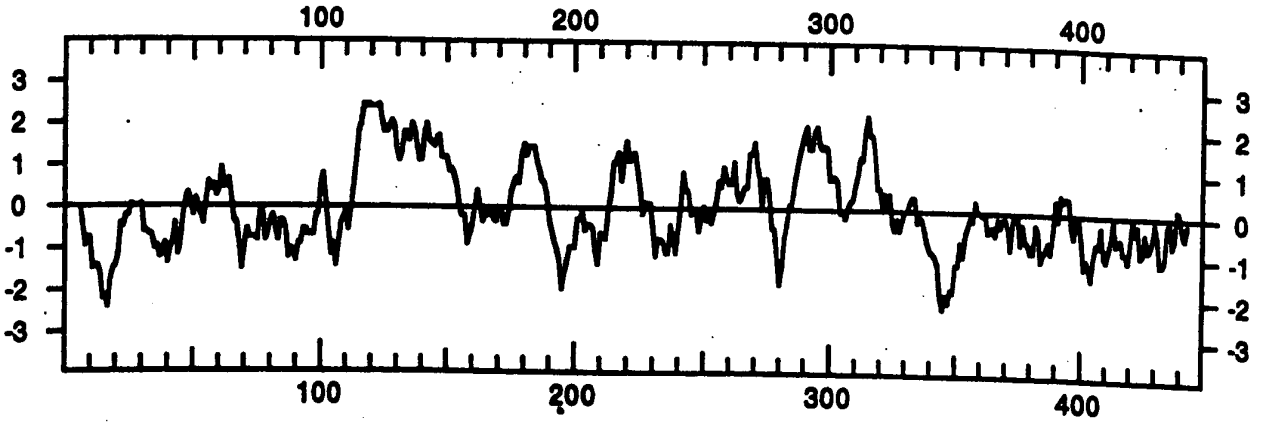
FIGURE 11

FIGURE 12B



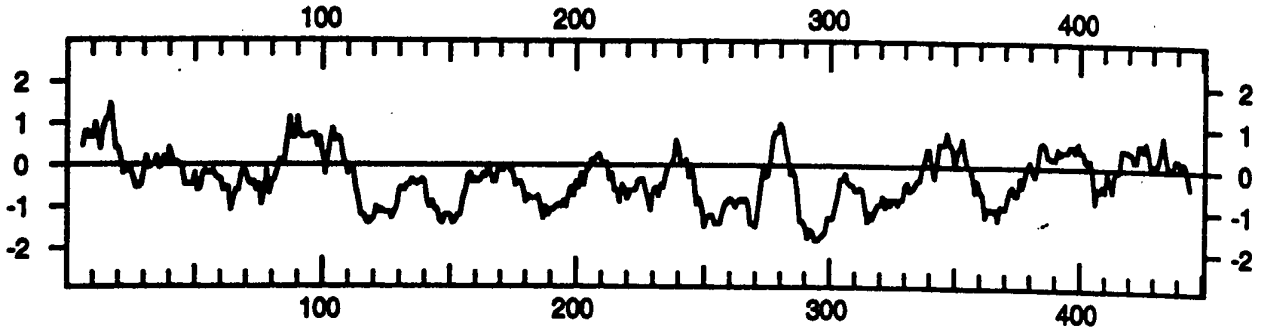
Evening Primrose Putative Δ^6-Desaturase Kyte-Doolittle Hydrophobicity Plot

FIGURE 12A



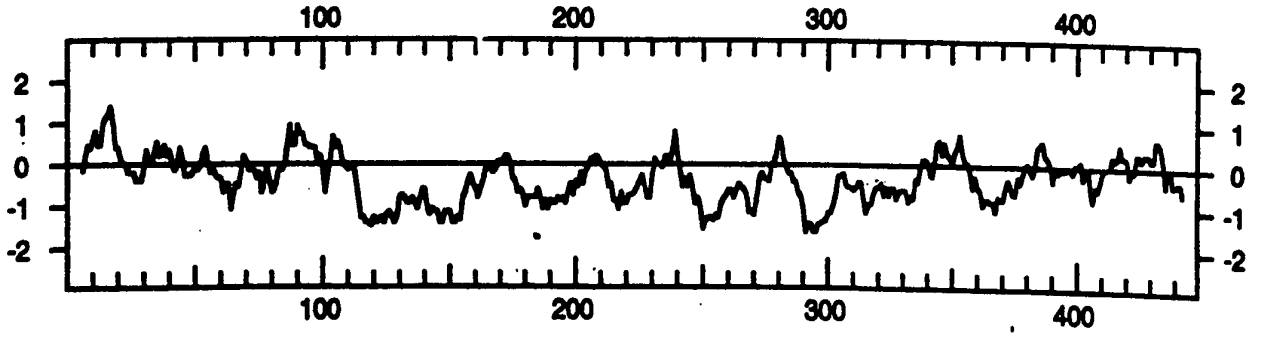
Borage Δ^6-Desaturase Kyte-Doolittle Hydrophobicity Plot

FIGURE 13B



Evening Primrose Putative Δ^6-Desaturase Hopwood Hydrophilicity Plot

FIGURE 13A



Borage Δ^6-Desaturase Hopwood Hydrophilicity Plot

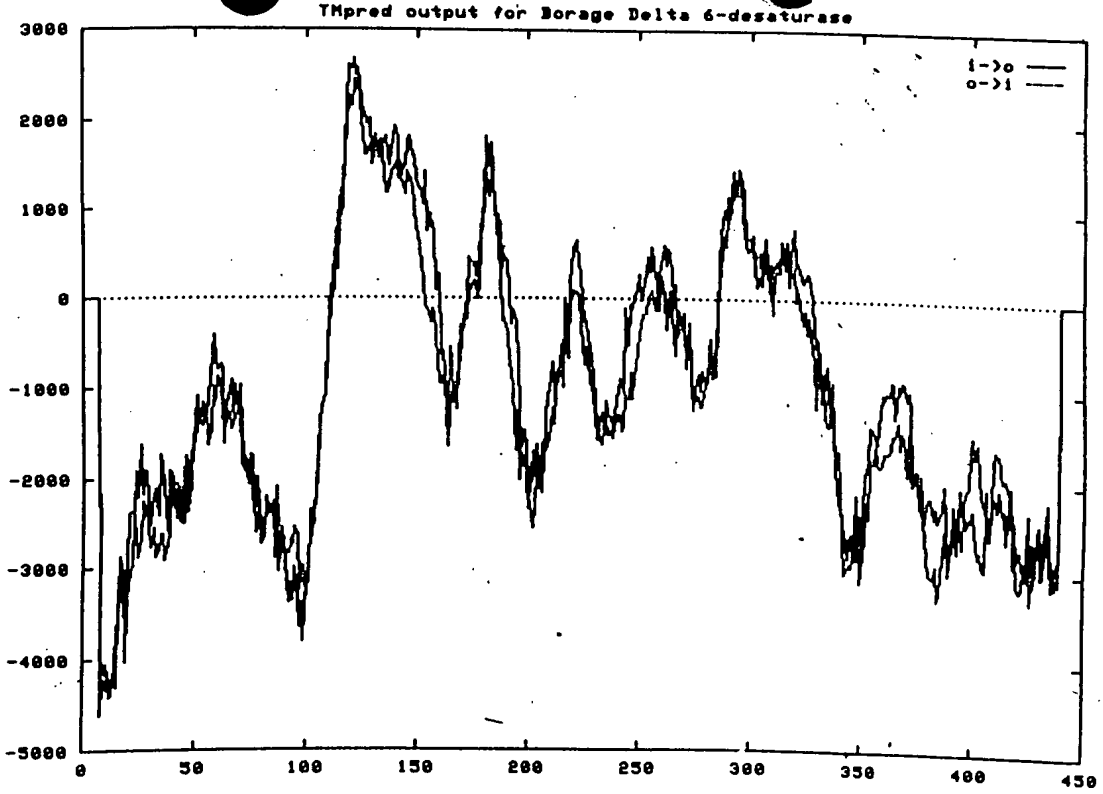


FIGURE 14A

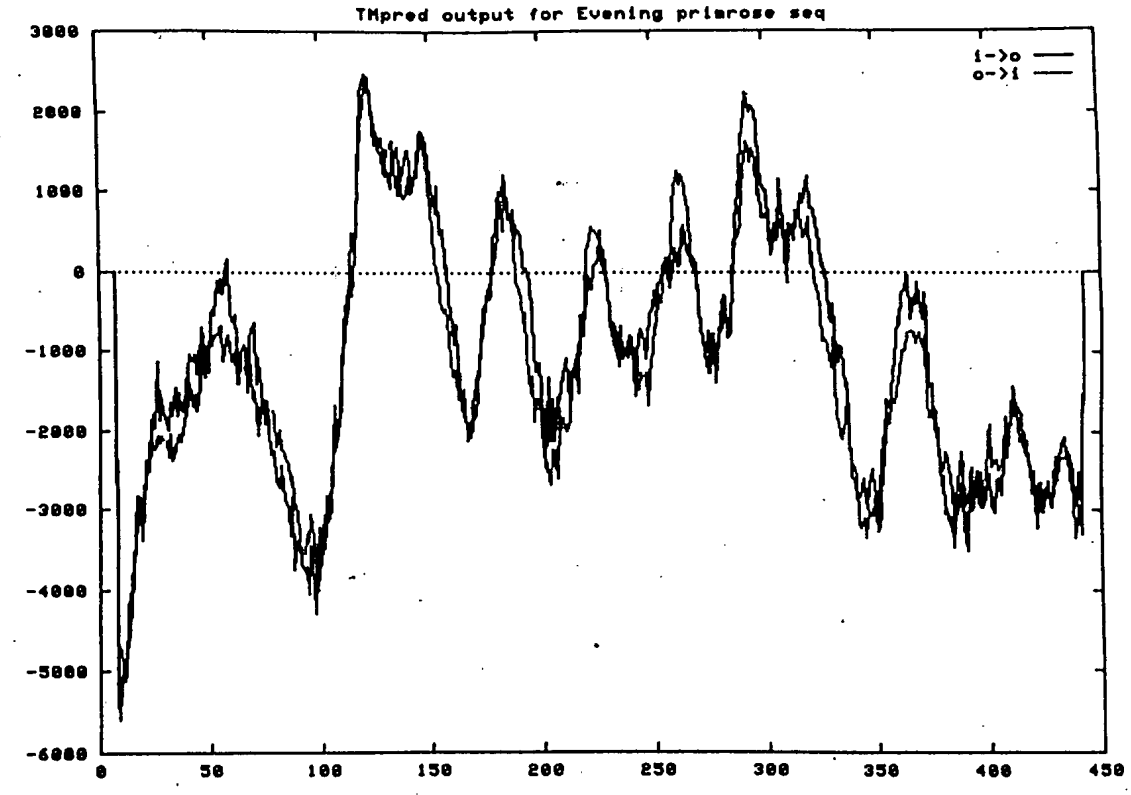


FIGURE 14B